STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

DESIRE ALDER

ROAD PLAN

SECTION 36, TOWNSHIP 11 NORTH, RANGE 07 WEST, W.M.
PACIFIC COUNTY

St. HELENS DISTRICT

AGREEMENT NO.: 30-077431 CONTRACT ADMINISTRATOR: Rich Wallmow

DATE: 08/01/2005 STAFF ENGINEER: Matt Beaulaurier

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to optional construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition and application of rock;
grass seeding.

SECTION 1 - GENERAL CLAUSES

1.1-1
Clauses in this plan apply to all construction including landings unless otherwise noted.

1.1-3
Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Spur A	4+69	Construction
Spur B	7+01	Construction

1.1-4
If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5
On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-7
Hauling of forest products or equipment may require a county road hauling permit. Purchaser is responsible for obtaining a permit, and any costs associated with extra maintenance or repair levied by a county.

1.2-1
The construction of any road specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application.

1.3-2

All optional Roads are intended for dry weather use. Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-3

Snowplowing will be permitted only after execution of a “Snow Plowing Agreement,” which is available from the Contract Administrator upon request.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed. Stumps over 22 inches diameter shall be split. Stumps over 40 inches shall be quartered.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

3-5

Organic material shall be excluded from the road subgrade width as shown in TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-2

Purchaser shall not bury merchantable material.

5.1-3

Road grade and alignment shall conform to the State's marked location. The reconstruction of existing road grades shall conform to the original location except where controlled by slope stakes. Grade and alignment shall have smooth continuity, without abrupt changes in direction.

Construction limitations are as follows:

Favorable Grade	Adverse Road Grade	Minimum Curve Radius
18%	12%	60 feet

Changes in road grade shall not exceed 6% within 100 feet. Adverse grades on curves shall not exceed 10% of the curve radius. Favorable grades through switchbacks shall not exceed 12%. Transition grades entering and leaving switchbacks shall not exceed a 5% grade change.

A switchback is defined as a curved segment of road between a beginning and end of the same curve, where the change of traffic travel direction is greater than 90 degrees.

Transition grades required to meet switchback grade limitations shall be constructed on the tangents preceding and departing from the switchbacks.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from road subgrade.

5.1-14

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width.

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-2

Waste material shall not be deposited within 100 feet of a live stream or within a riparian management zone.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-5

When constructing landings, waste material shall not be placed on side slopes steeper than 45%.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the right-of-way limits, or restrict drainage.

5.3-1

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

On all roads, Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On all construction, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator. Required seed not spread by the termination of this contract shall become property of the State.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

5.5-3

Constructed subgrades shall be compacted full width except ditch prior to rock application by 4 coverages with a grid roller weighing at least 20,000 pounds and at a minimum operating speed of 5 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2

Manufacturer's approved hinged split coupler bands shall be used on corrugated polyethylene pipe, bands shall have a minimum of 4 corrugations, 2 on each side of the pipe joint.

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-6

Rock for construction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

7.2.1.2-2

PIT RUN rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash. Pit run rock will meet the following specifications for rock gradation when placed on the subgrade: No more than 10% of the rock shall be larger than 8 inches in any dimension and no rock shall be larger than 12 inches in any dimension.

7.2.3-1

Measurement of the PIT RUN rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the ROCK LIST. Rock shall meet the specifications on the ROCK LIST.

7.4.2-5

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-4

Rock shall be spread and compacted full width lifts not to exceed 14 inches uncompacted depth. Compaction shall be by grid roller weighing at least 14,000 pounds. At least four complete passes at a minimum speed of 5 mph shall be made.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

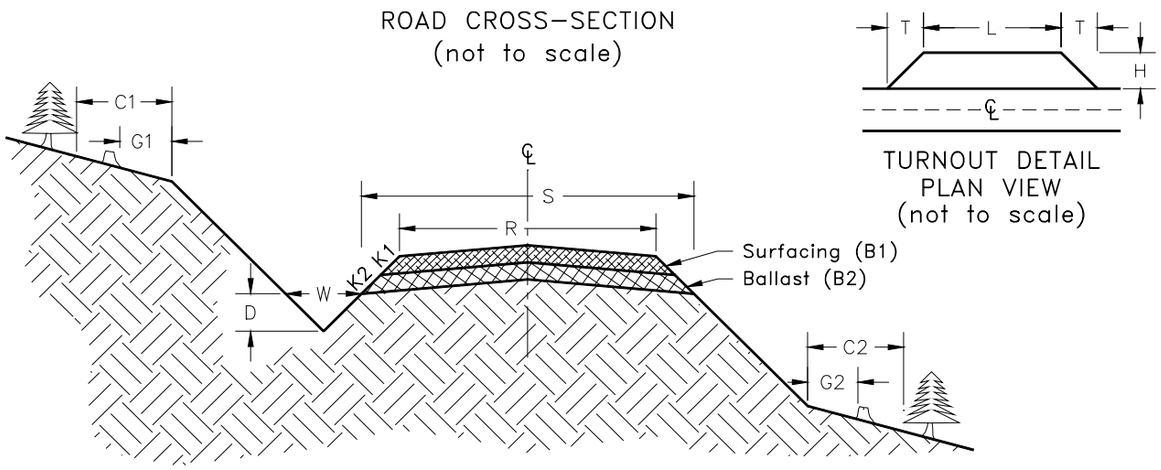
9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

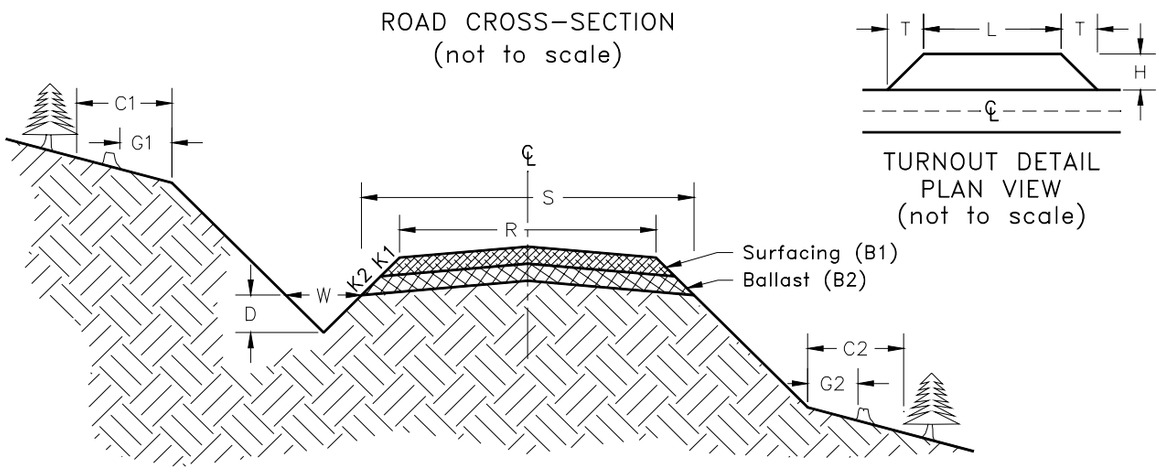
Landing embankments shall be sloped to original construction specifications.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
Spur A	0+00	4+69	C	16’	12’	3’	1’	4”	2’	2’	5’	5’
Spur B	0+00	7+01	C	16’	12’	3’	1’	4”	2’	2’	5’	5’

ROCK LIST



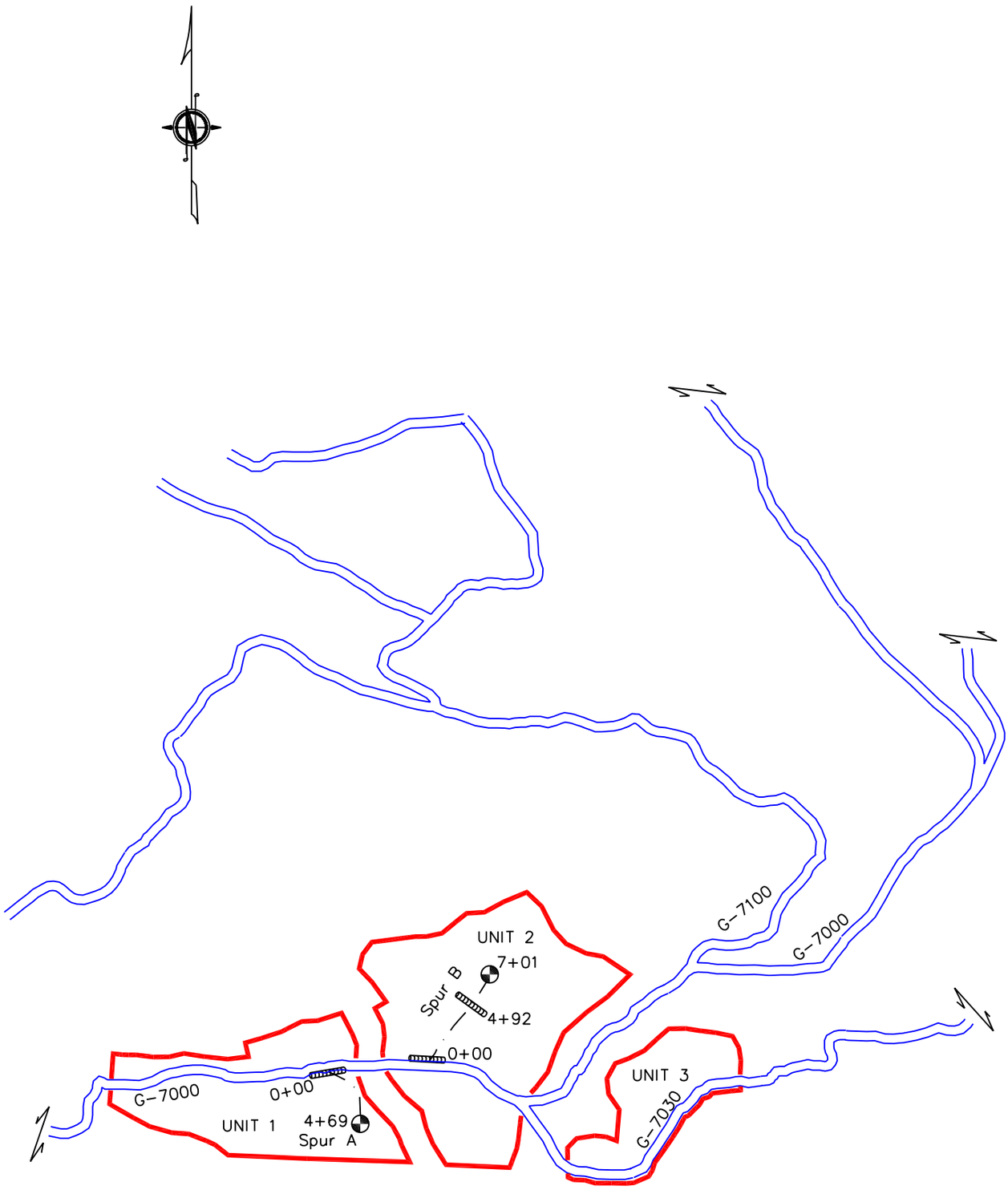
BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2	PIT RUN				L	H	T
Spur A	0+00	4+69	1½:1	14”	75	4.69	352	Commercial Source			
Spur B	0+00	7+01	1½:1	14”	75	7.01	526				
Landings/Misc.					75	2	150				

BALLAST TOTAL **1,028** Cubic Yards

DESIRE ALDER

ROAD PLAN MAP



LEGEND

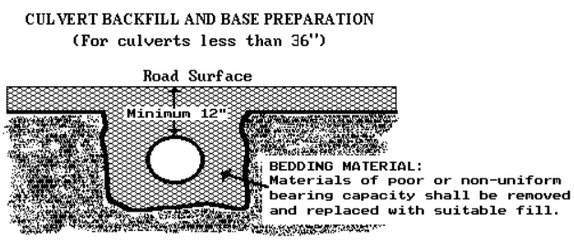
Unit Boundary
Existing Road
Optional Construction
Culvert
Landing

0 100 1000

Scale = FEET

CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Placement Method	Const. Staked	Remarks
			If Steel										
Spur A	0+00	18”	-	45	-	-	-	-	-	NT	-	-	CPP
Spur B	0+00	18”	-	45	-	-	-	-	-	NT	-	-	CPP
	4+92	18”	-	30	-	-	-	-	-	NT	-	-	CPP

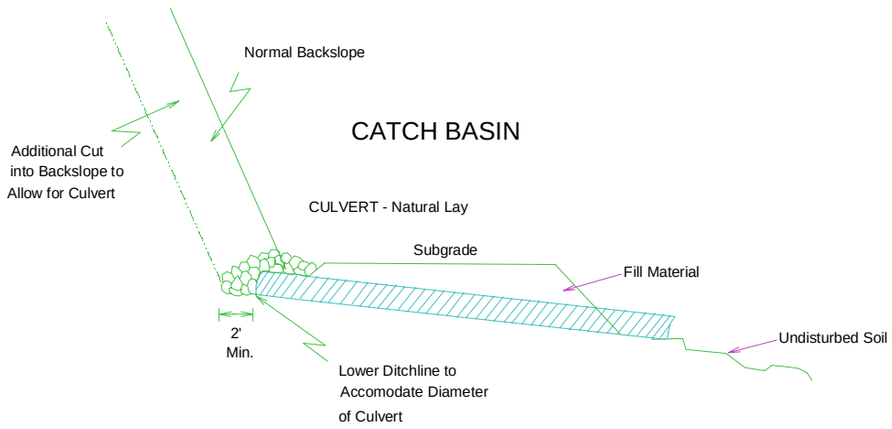


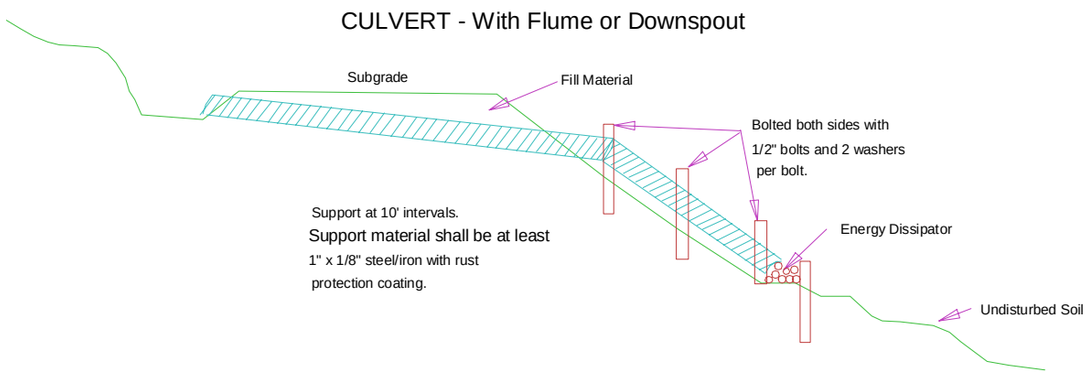
Key:

SR - Shot Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe
CPP – Corrugated Polyethylene pipe

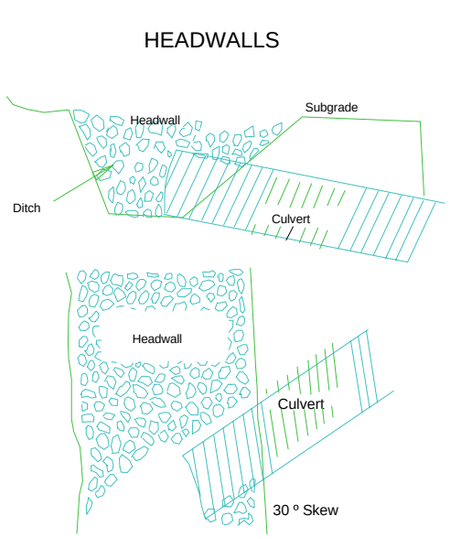
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)

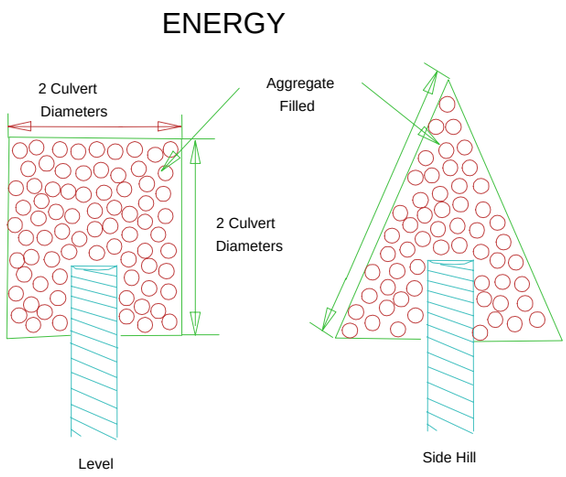




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

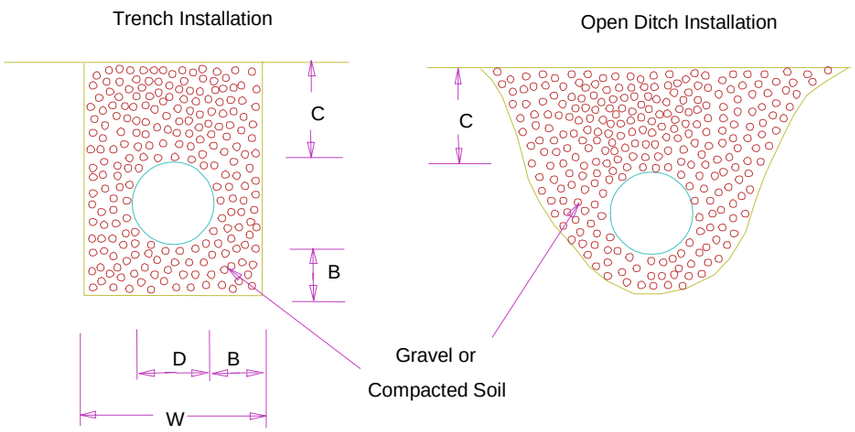
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% of that material is required. This minimum compaction can be achieved by either hand or mechanical tamping. Purchaser shall test the compaction level and bare all associated costs.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 12:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

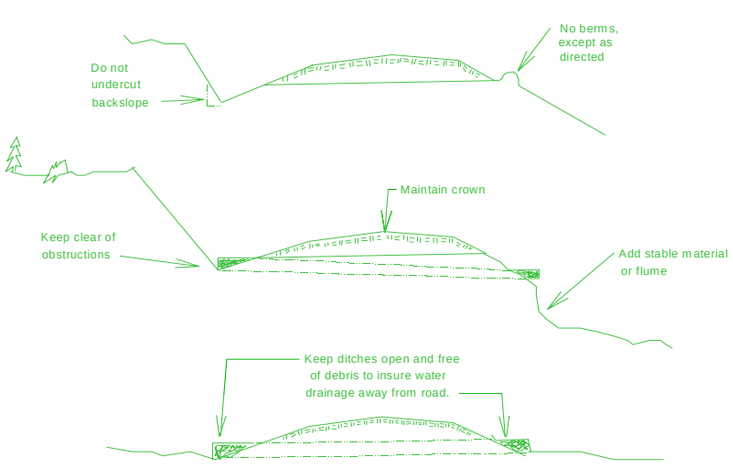
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.



DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

SUMMARY - Road Development Costs

DISTRICT: St. Helens

SALE/PROJECT NAME: DESIRE ALDER TBS CONTRACT NUMBER: 30-077431

LEGAL DESCRIPTION: 36(11-07) W

		Spur A	Spur B
ROAD NUMBER:		Spur A	Spur B
ROAD STANDARD:		Construction	Construction
NUMBER OF STATIONS:		4.69	7.01
SIDESLOPE:			
CLEARING AND GRUBBING:		$499	$746
EXCAVATION AND FILL:		$516	$617
MISC. MAINTENANCE:			
ROCK TOTALS (Cu. Yds.):			
Ballast:	1028	$6,457	$9,089
Surface:	0	$0	$0
Riprap:	0	$0	$0
CULVERTS AND FLUMES:		$531	$885
STRUCTURES:		$0	$0
GENERAL EXPENSES:		$880	$1,134
MOBILIZATION:		$575	$575
TOTAL COSTS:		$9,458	$13,046
COST PER STATION:		2016.61712	$1,861

ROAD DEACTIVATION AND ABANDONMENT COSTS: $2,000

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $24,504

SALE VOLUME MBF = 1,887

TOTAL COST PER MBF = $12.99

Plans to be furnished by: Compiled by: Matt Beaulaurier Date: 04/21/05

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - CONSTRUCTION

SALE NAME: DESIRE ALDER TBS CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

	Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur A		5	35	1.00	2.66	$40	1.00	4.69	$499
					1.00				
					1.00				
					1.00				
					1.00				
					1.00				

Clear and Grub TOTAL = $499

II. EXCAVATION:

	Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur A		5	1.00	1.25	$88	1.00	4.69	$516
				1.00				
				1.00				
				1.00				
				1.00				

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts				$0

Excavation TOTAL = $516

III. BALLAST AND SURFACING :

Ballast source: Commercial
Surface source:
Riprap source :

Description	cu.yds/sta	x stations	= cubic yards
Ballast (4"-)	75	5.69	427
Surfacing (2 1/2"-)			0
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot			
Dig and load			
Crushing			
Purchase	$7.00		
Haul *	$8.13	$8.13	$8.13
Spread			
Compact			
Strip			
Reclamation			
TOTAL ($/cy)	$15.13	$8.13	$8.13

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	35.0						
Ave. Speed =	25	Ballast (4"-)	427	Cu. yds @	$15.13	/cu. yd =	$6,457
Delay (Hrs.)=	0.1	Surfacing (2 1/2	0	Cu. yds @	$8.13	/cu. yd =	$0
Cost / Hour =	$65.00	Riprap	0	Cu. yds @	$8.13	/cu. yd =	$0
CY / Load =	12						

Rock total = $6,457

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
CPP	1		18"	45	$11.80	$531

Bands & Gaskets $0

Culvert total = $531

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $8,003

VI. GENERAL EXPENSES: Overhead & General Exp. Add 11% $880

VII. MOBILIZATION:

* Move in costs are averaged over all two sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400		$0
Compactor	400		$0
Excavator	450	1	$450
Dozer D8)	400	1	$400
Front end loader	400		$0
Rock crusher	$1,500		$0
Dozer (D5)	$240		$0

Total Mobilization = $1,150 Mobilization sub-total = $575

Road No. Spur A
Standard: Construction
Stations: 4.69

SHEET TOTAL = $9,458

By: Matt Beaulaurier Sheet 2 of 5 Date: 04/21/05

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - RECONSTRUCTION

SALE NAME: DESIRE ALDER TBS CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur B	3	35	1.00	2.66	$40	1.00	7.01	$746
				1.00				$0
				1.00				$0
				1.00				$0
				1.00				
				1.00				

Clear and Grub TOTAL = $746

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur B	3	1.00	1.00	$88	1.00	7.01	$617
			1.00				$0
			1.00				$0
			1.00				
			1.00				

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts				$0

Excavation TOTAL = $617

III. BALLAST AND SURFACING :

Ballast source: Commercial
Surface source:
Riprap source :

Description	cu.yds/sta	x stations =	cubic yards
Ballast (4"-)	75	8.01	601
Surfacing (2 1/2"-)			0
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot			
Dig and load			
Crushing			
Purchase	$7.00		
Haul *	$8.13	$8.13	$8.13
Spread			
Compact			
Strip			
Reclamation			
TOTAL ($/cy)	$15.13	$8.13	$8.13

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	35.0						
Ave. Speed =	25	Ballast (4"-)	601	Cu. yds @	$15.13	/cu. yd =	$9,089
Delay (Hrs.)=	0.1	Surfacing (2 1/2	0	Cu. yds @	$8.13	/cu. yd =	$0
Cost / Hour =	$65.00	Riprap	0	Cu. yds @	$8.13	/cu. yd =	$0
CY / Load =	12						

Rock total = $9,089

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
CPP	1		18	45	$11.80	$531
CPP	1		18	30	$11.80	$354
						$0

Bands & Gaskets

Culvert total = $885

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $11,337

VI. GENERAL EXPENSES: Overhead & General Exp. Add 10% $1,134

VII. MOBILIZATION:

* Move in costs are averaged over all two sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	3	$300
Grader	$400	0	$0
Compactor	$400	0	$0
Excavator	$450	1	$450
Dozer D8)	$400	1	$400
Front end loader	$400	0	$0
Rock crusher	$1,500	0	$0
Dozer (D5)	$240	0	$0

Total Mobilization = $1,150 Mobilization sub-total = $575

Road No. Spur B
Standard: Construction
Stations: 7.01

SHEET TOTAL = $13,046

By: Matt Beaulaurier Sheet 3 of 5 Date: 04/21/05